CLAIMS

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A pad for planarizing a workpiece which comprises a polymeric matrix and solid lubricant particles in an amount sufficient to reduce friction between the pad and workpiece during planarizing.

2. The pad of claim 1, wherein the solid lubricant particles comprise fluoropolymers selected from the group consisting of poly (tetrafluorethylene((PTFE), fluoroethylene-propylene copolymers (FEP), perfluoroalkoxy resins (PFA) ethylene-chlorotrifluoroethylene alternating copolymer (ECTFE), poly (vinylidene fluoride) PVDE and mixtures thereof.

3. The pad of claim 1, wherein the lubricant particles have a coefficient of friction of 0.03 to about 0.3.

4. The pad of claim 1 wherein the solid lubricant particles have a spherical shape, a cylindrical shape, or a platelet shape, and optionally contain cut fibers.

5. The pad of claim 1 wherein the size of the solid lubricant particles is about 0.05 to about 18 microns.

6. The pad of claim 1 wherein the size of the solid lubricant particles is about 0.05 to about 0.5 microns.

7. The pad of claim 2 wherein the organic fluoropolymers have a weight average molecular weight of about $1x\ 10^5$ to about $5x\ 10^5$.

8. The pad of claim 1 wherein the amount of solid lubricant particles is about 0.5 to about 30% by weight.

9. The pad of claim 1 wherein the amount of solid lubricant particles is about 0.5 to about 10% by weight.

10. The pad of claim 1 wherein the amount of the solid lubricant particles is about 2 to 3% by weight.

11. The pad of claim 1 wherein the solid lubricant particles are pretreated with a surfactant in an amount sufficient to disperse the lubricant particles in a planarizing slurry upon being detached from the pad during planarizing.

12. The pad of claim 1 wherein the polymeric matrix comprises at least one member selected from the group consisting of polyurethane, polycarbonate, polyamide, polysulfone, polyvinyl chloride, polyacrylate, polymethacrylate, polyvinylalcohol, polyester and polyacrylamide.

13. The pad of claim 1, wherein the polymeric matrix is microporous.

14. The pad of claim 1, wherein the polymeric matrix is non-porous.

15. The pad of claim 1, wherein the pad surface contains macroscopic channels before use and microscopic texture during use to facilitate slurry transport.

16. The pad of claim 1, wherein said lubricant particles comprises at least one member selected from the binding agent, coupling agent or adhesive promoter.

17. A method for planarizing a surface which is formed on a substrate which comprises providing on the surface to be planarized a liquid polish slurry composition;

and contacting said surface with a polishing pad that comprises a polymeric matrix and solid lubricant particles in an amount sufficient to reduce friction between the pad and surface during planarizing.

18. The method of claim 17, wherein the solid lubricant particles comprise fluoropolymers selected from the group consisting of poly (tetrafluorethylene ((PTFE), fluoroethylene-propylene copolymers (FEP), perfluoroalkoxy resins (PFA) ethylene-chlorotrifluoroethylene alternating copolymer (ECTFE), poly (vinylidene fluoride) PVDE and mixtures thereof.

19. The method of claim 17, wherein the lubricant particles have a coefficient of friction of 0.03 to about 0.3.

20. The method of claim 17, wherein the solid lubricant particles have a spherical shape, a cylindrical shape, or a platelet shape, and optionally contain cut fibers.

21. The method of claim 17, wherein the size of the solid lubricant particles is about 0.05 to about 18 microns.

22. The method of claim 17, wherein the size of the solid lubricant particles is about 0.05 to about 0.5 microns.

23. The method of claim 17, wherein the organic fluoropolymers have a weight average molecular weight of about $1x\ 10^5$ to about $5x\ 10^5$.

24. The method of claim 17, wherein the amount of solid lubricant particles is about 0.5 to about 30% by weight.

25. The method of claim 17 wherein the amount of solid lubricant particles is about 0.5 to about 10% by weight.

26. The method of claim 17, wherein the amount of the solid lubricant particles is about 2 to 3% by weight.

27. The method of claim 17, wherein the solid lubricant particles are pretreated with a surfactant in an amount sufficient to disperse the lubricant particles in a planarizing slurry upon being detached from the pad during planarizing.

28. The method of claim 17, wherein the polymeric matrix comprises at least one member selected from the group consisting of polyurethane, polycarbonate, polyamide, polysulfone, polyvinyl chloride, polyacrylate, polymethacrylate, polyvinylalcohol, polyester and polyacrylamide.

29. The method of claim 17, wherein the polymeric matrix is microporous.

30. The method of claim 17, wherein the polymeric matrix is non-porous.

31. The method of claim 17, wherein the pad surface contains macroscopic channels before use and microscopic texture during use to facilitate slurry transport.

32. The method of claim 17, wherein said lubricant particles comprises at least one member selected from the group consisting of a binding agent, coupling agent or adhesive promoter.

33. A method according to claim 17, wherein the surface to be polished is selected from the group consisting of A1, A1 alloys, Cu, Cu alloys, Ag, Ag-alloys, Au, Au alloys,W, W alloys, silicon oxide, polysilicon, silicon nitride, Ta, Ta alloys, Ti, Ti alloys, low-k dielectric and combinations thereof.

34. A method according to claim 17, wherein the surface to be polished contains at least one low-k dielectric selected from the group consisting low-k porous dielectric, low-k non-porous dielectric and air bridges and combinations thereof.

35. A method according to claim 34 wherein said low-k dielectric comprises at least one member selected from the group consisting of CVD carbon-doped silicon oxide, spin on organo silicate and spin on organic polymer.

36. A method according to claim 17, wherein said planarizing is chemical-mechanical polishing (CMP).